ERIC KUNKEL
ELECTRICAL ENGINEER

YEARS OF RELEVANT EXPERIENCE: 11

EDUCATION AND TRAINING:

BS	Electrical Engineering	Pennsylvania State University	2002

RELEVANT QUALIFICATIONS:

- Firmware Reverse Engineering
- Hardware (HW) Reverse Engineering
- Electronic Data Recovery/Forensics
- Data Analysis
- C and C++ Development
- Embedded Executable Code Disassembly
- Electronic Analysis
- HW Emulators & Debuggers
- Custom Data Analysis/Parsing Software

SUMMARY OF EXPERIENCE

Mr. Kunkel has more than eleven years of engineering experience. He currently supports the FBI's Embedded Engineering Program (EEP) in Quantico, Virginia, applying both his hardware and firmware reverse engineering skills to aid in the missions of the team. This includes data recovery and analysis from consumer electronic devices as well as hardware and software design. He has also supported the FBI's Improvised Explosive Device Electronics (IEDE) Program, analyzing the electronic triggers of custom-built and commercial electronic devices employed in improvised explosive devices (IEDs) used by terrorists.

APPLICABLE EXPERIENCE

Booz Allen Hamilton **July 2004 to Present**

Mr. Kunkel is currently an engineer on Booz Allen's Embedded Engineering effort for the FBI's Operational Technology Division, Embedded Engineering Program located in Quantico, Virginia. The FBI's EEP Program receives its analysis requests mostly from the law enforcement and intelligence communities. Mr. Kunkel examines a wide range of consumer electronic devices to determine functionality and retrieves electronic data for analysis purposes. Representative devices include all types of mobile phones, tablets, various memory cards, personal recording devices and thumb drives. He programs, debugs, and tests DSP based devices. He develops specific hardware and software tools to expeditiously process devices. He also investigates new technologies in the field of digital forensics to determine their possible viability and usefulness to the team.

Previously, Mr. Kunkel was the lead electronic data recovery (EDR) engineer on Booz Allen's Improvised Explosive Device (IED) Electronic Analysis effort for the FBI's Operational Technology Division, IEDE Program located in Quantico, Virginia. Mr. Kunkel determined the viability of retrieving electronic data from consumer electronic devices. He used both software and hardware data extraction tools to retrieve data from a wide variety of mobile and embedded technology devices used in IEDs. He successfully analyzed and reverse engineered unknown data contained in raw memory dumps and microcontroller firmware using the IDAPro tool. In addition, an extensive knowledge

base was developed and used to create proprietary tools to decode and interpret the extracted data. Representative devices include long-range cordless phone (LRCT) products, mobile phones, subscriber identity module (SIM) cards, and mobile radios.

Applied Research Laboratory, Penn State University June 2002 to July 2004

Mr. Kunkel was a researcher for the Applied Research Laboratory at Penn State. He participated in projects commissioned by the U.S. Navy for undersea and surface ship warfare research. He participated in field research exercises in Washington State and Canada supporting the lab's 2003 broadband field experiments. He served as data analyst and data custodian while in the field, in charge of safekeeping and handling large amounts of classified data on both Windows and Sun platforms. He debugged and redesigned C++ code used for weapon detection from a surface ship's sonar array. He researched and created algorithms in the field of independent component analysis (ICA) for a more robust method of target detection in an undersea environment. He modified and enhanced MATLAB code for simulating and analyzing various active broadband and narrowband homing scenarios.